

ABSTRACT

The invention provides methods and systems for controlling the expression and, 5 in general, the cellular activity of preselected polynucleic acid molecules. The invention also provides methods and systems for genetically modifying cells and multi-cellular organisms to impart resistance to viruses. The invention further provides methods and systems for genetically modifying cells and multi-cellular organisms so that they diagnostically report viral infection. One aspect of the invention involves rendering 10 target polynucleic nucleic acid molecules as functional templates for at least one template-directed polynucleic acid polymerase so that utilization of the polynucleic acid molecule as a template by the polymerase modulates the activity of the targeted polynucleic acid molecule. Other aspects of the invention of the invention involve rendering selected polynucleic nucleic acid molecules as targets for RNA silencing, 15 whether or not the silencing is polymerase-mediated.